TCS-60DV

SERVICE MANUAL

Ver 1.0 1999. 03

US Model
Canadian Model
AEP Model
E Model

Model Name Using Similar Mechanism	TCM-50DV
Tape Transport Mechanism Type	MT-50-30

SPECIFICATIONS

Recording system	4-track 2 channel stereo
Tape speed	4.8 cm/s or 2.4 cm/s
Frequency range	250 – 8,000 Hz using nomal (TYPE1) cassette (with REC TIME switch at “NORMAL”)
Speaker	Approx. 3.6 cm ($1^{7}/_{16}$ in.) dia. ×2
Power output	Speakers : 160 mW + 160 mW (at 10 % harmonic distortion)
	Headphones : 6 mW + 6 mW (at 10 % harmonic distortion)
Input	Microphone input jack (minijack) sensitivity 0.2 mV for 3 Ω or lower impedance microphone
Output	∩ (headphones) jack (minijack) for 8 – 300 Ω earphone
Variable range of the tape speed	From approx. +25 % to – 15 % (with REC TIME switch at “NOMAL”)
Power requirements	3 V DC batteries AA (R6) ×2/ External DC 3 V power sources
Dimensions (w/h/d)(incl. projecting parts and controls)	Approx. 88.7 × 113.4 × 41.3 mm ($3^{1}/_{2} \times 4^{1}/_{2} \times 1^{11}/_{16}$ inches), incl.
Mass	Approx. 280 g (9.9 oz)

Design and specifications are subject to change without notice

CASSETTE CORDER

MICROFILM

SONY®

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Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270˚C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

SECTION 1
SERVICE NOTE

The TCS-60DV detects rotation of both the supply and take-up side reels using the PH701 (photo reflector). Because the PH701 is mounted on the Main board, auto stop is activated and reel rotation cannot be detected when the Main board is removed. To check the operation of mechanism deck and voltage without the Main board, follow the procedure as described below.

How to remove the Main board (opening the Main board)

1) Refer to page 5 “3. Disassembly”.

How to enter the fast forward/rewind modes

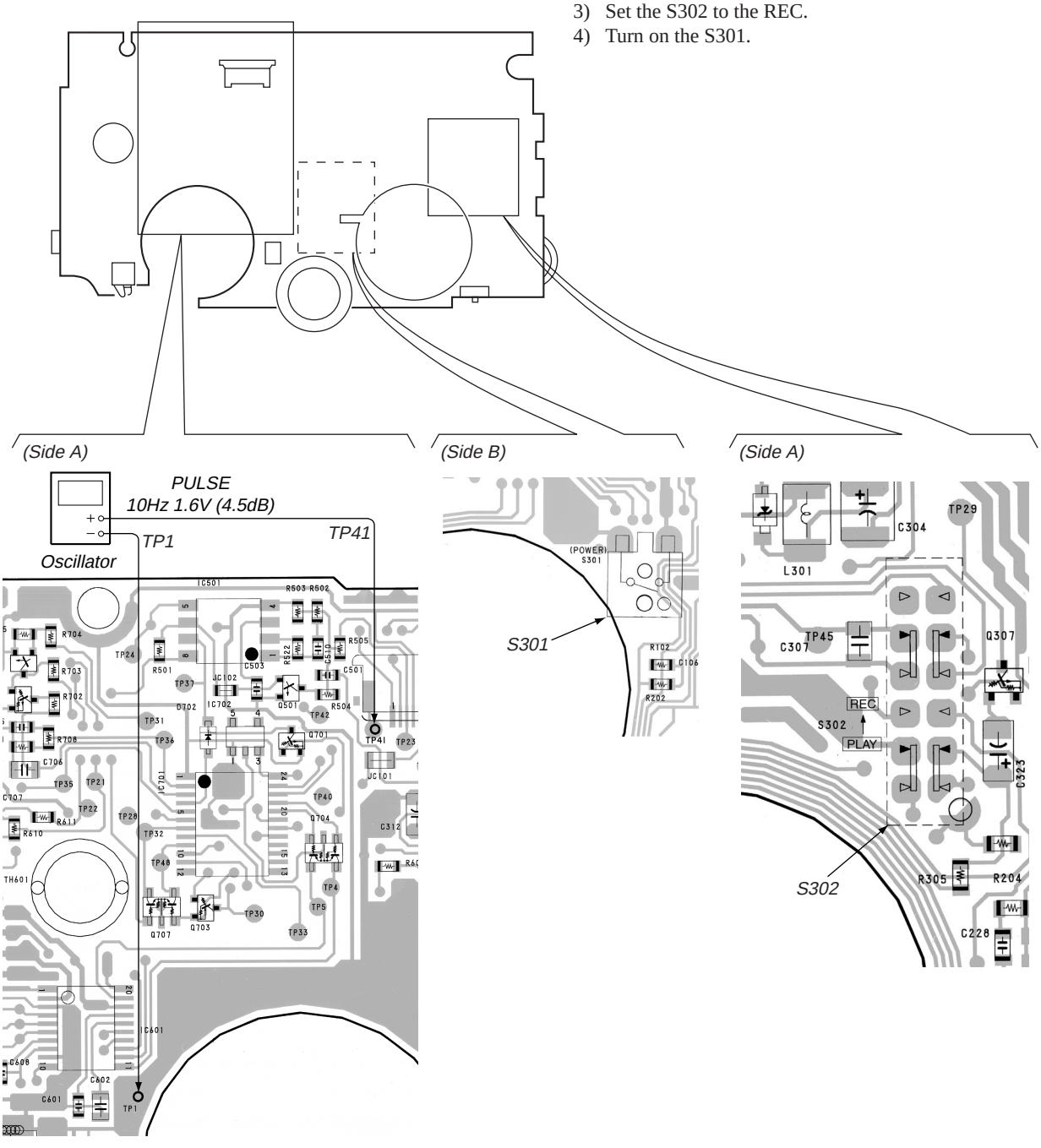
1) Input the square wave to the TP41. (Refer to the illustration below.)
2) Press the fast forward/rewind keys.
3) Turn on the S301.

How to enter the playback mode

1) Input the square wave to the TP41. (Refer to the illustration below.)
2) Press the playback key.
3) Set the S302 to the PLAY.
4) Turn on the S301.

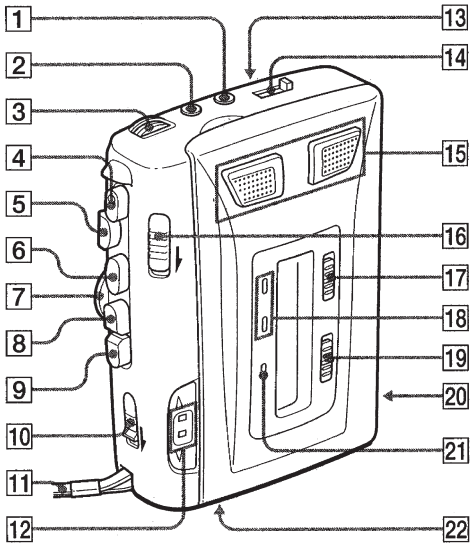
How to enter the record mode

1) Input the square wave to the TP41. (Refer to the illustration below.)
2) Press the record key.
3) Set the S302 to the REC.
4) Turn on the S301.



SECTION 2
GENERAL

This section is extracted from instruction manual.



1 ∩ Headphone jack
2 MIC (PULG IN POWER) jack
3 VOL knob
4 ● REC button
5 ■ STOP button
6 PLAY button
7 SPEED CONTROL knob
8 REW/REVIEW button
9 FF/CUE button
10 DIR ➡ switch
11 Hand strap
12 Tape direction indicators
13 SPEAKER (REAR SIDE)
14 TAPE COUNTER switch
15 Flat mic
16 PAUSE ➡ switch
17 REC TIME switch
18 BATT/REC indicator
19 VOR switch
20 Battery compartment
21 ⏢ indicator
22 DC IN 3V jack

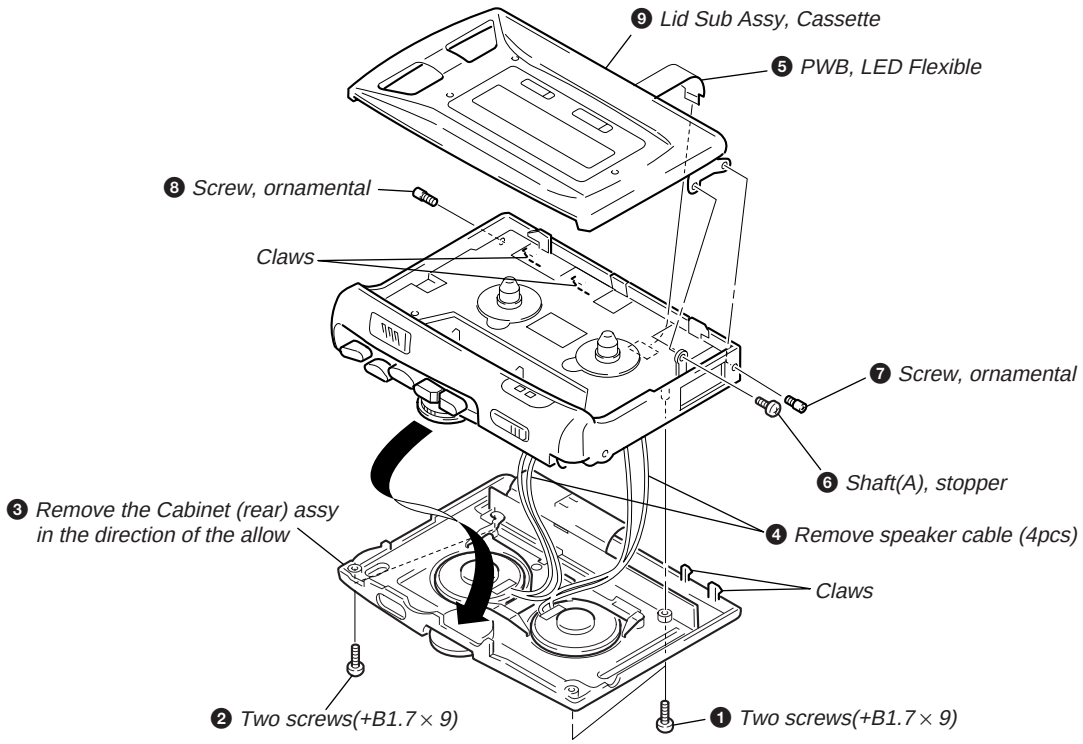
SECTION 3
DISASSEMBLY

Disassemble the unit in the order as shown below.

Set ➡ "Cabinet (rear) assy", "lid sub assy, cassette" ➡ Main board, Mechanism deck ➡ Belt ➡ Head
Motor, dc

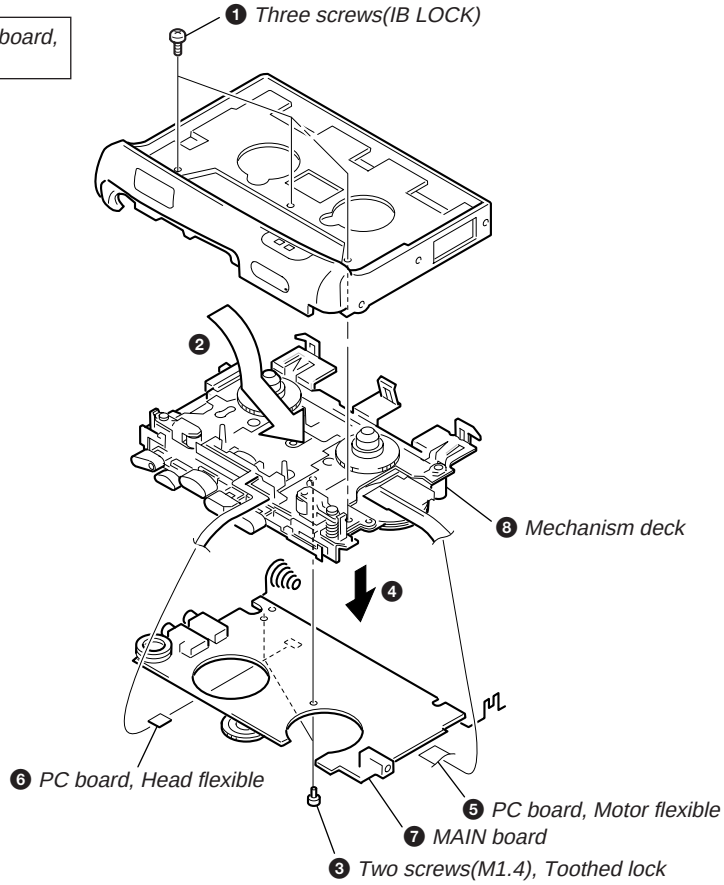
Note : Follow the disassembly procedure in the numerical order given.

3-1. "CABINET (REAR) ASSY", "LID SUB ASSY, CASSETTE"

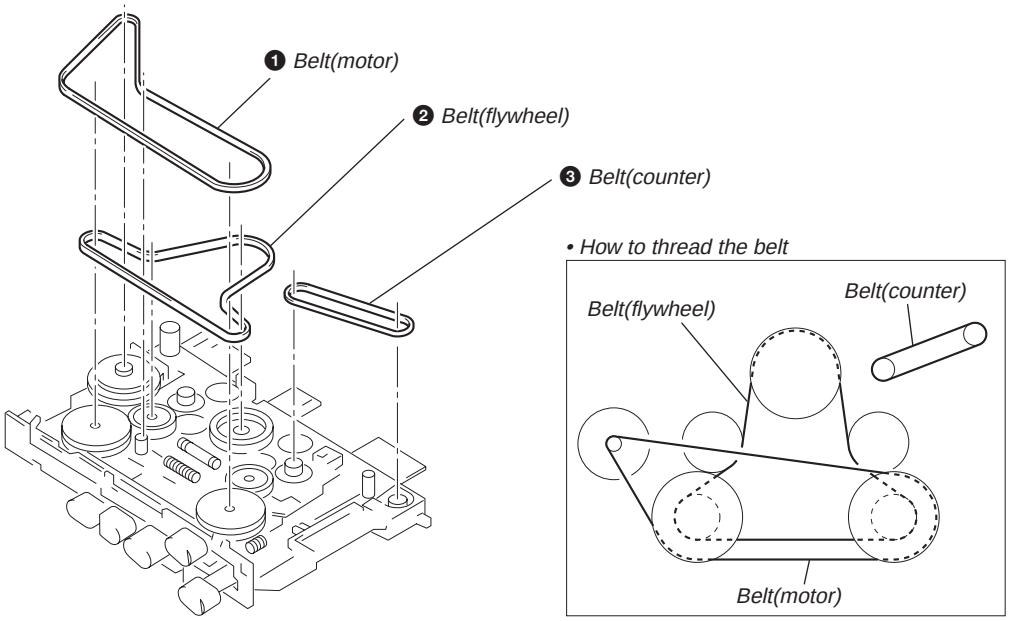

❾ Lid Sub Assy, Cassette
❺ PWB, LED Flexible
❽ Screw, ornamental
Claws
❼ Screw, ornamental
❻ Shaft(A), stopper
❸ Remove the Cabinet (rear) assy in the direction of the allow
❹ Remove speaker cable (4pcs)
Claws
❷ Two screws(+B1.7 × 9)
❶ Two screws(+B1.7 × 9)

3-2. MAIN BOARD, MECHANISM DECK

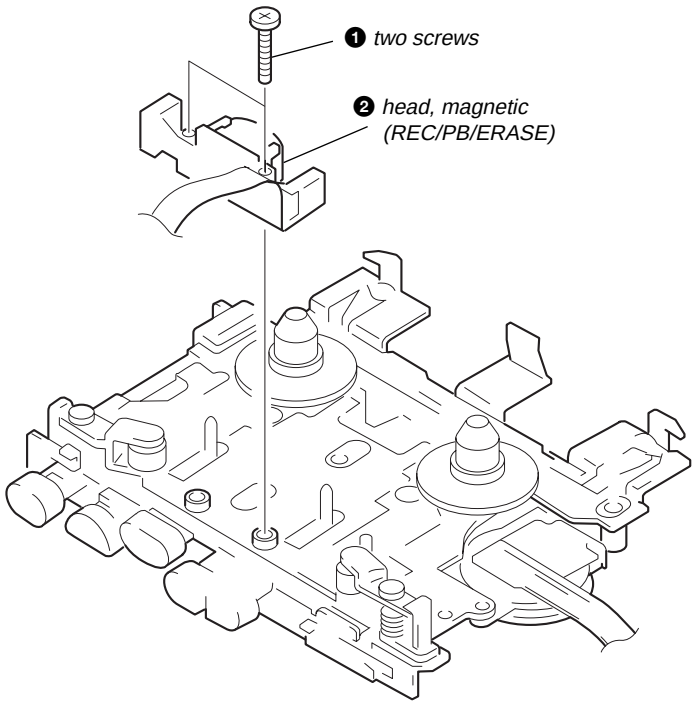
NOTE: For attaching the Main board, refer to the next page.



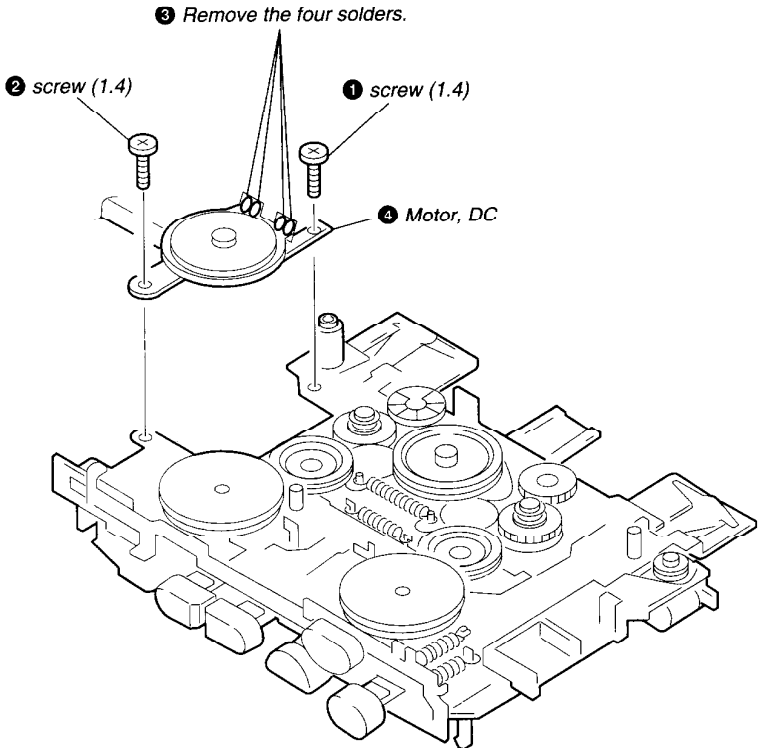
3-3. BELT



3-4. HEAD

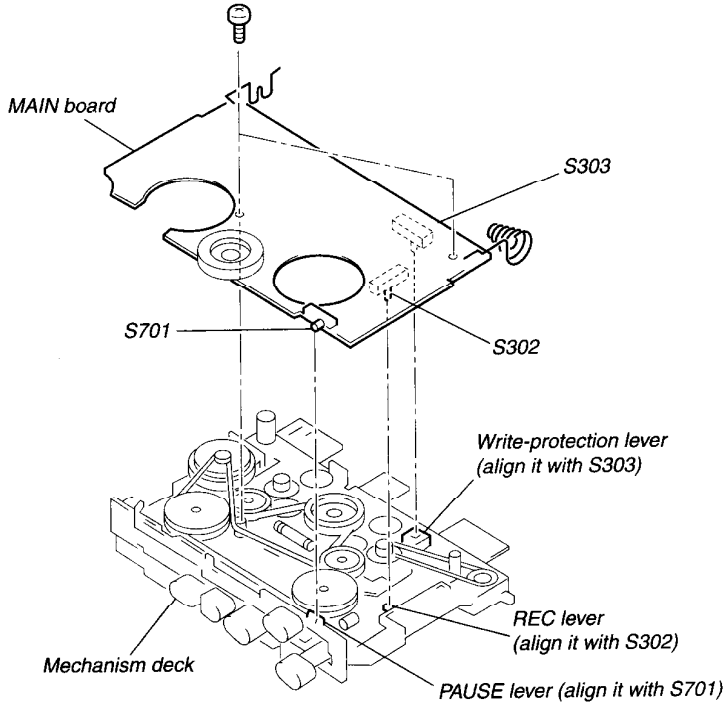


3-5. MOTOR, DC



3-6. PRECAUTION FOR ATTACHING THE MAIN BOARD

- *Attach the knobs of the switches S302, S303, and S701 on the Main board while aligning them with the claws of the REC lever, write-protection 2 lever, and the PAUSE lever respectively.*



SECTION 4
ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENT

PRECAUTION

1. Clean the following parts with a denatured-alchool-moistened swab:
   record/playback/erase head pinch roller
   head rubber belts
   capstans idlers
2. Demagnetize the record/playback/erase head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. Unless specified otherwise, use a specified voltage (3.0V) to perform the adjustments.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	20 – 35g•cm 0.28 – 0.48 oz•inch
FWD back tension		0.5 – 5.0g•cm 0.007 – 0.07 oz•inch
FWD	CQ-102RC	20 – 35g•cm 0.28 – 0.48 oz•inch
FWD back tension		0.5 – 5.0g•cm 0.007 – 0.07 oz•inch
FF	CQ-201B	more than 40g•cm
REW		more than 0.5 oz•inch

4-2. ELECTRICAL ADJUSTMENT

0dB = 0.775V

1. Perform adjustments on the following conditions unless otherwise specified.
   - Switches and controls positions
     VOL knob ..... Maximum
     SPEED CONTROL knob ..... Mechanical center
     V•O•R switch ..... OFF
     REC TIME switch ..... Normal

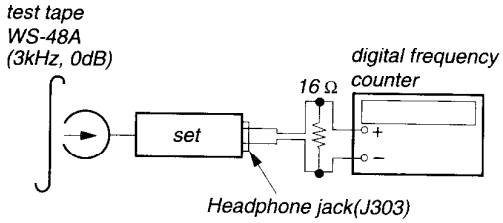
Test tape

Test Tape	Signal	Used for
WS-48A	3kHz, 0dB	Tape speed adjustment

Tape Speed Adjustment

Procedure :

Mode : Playback (FWD)



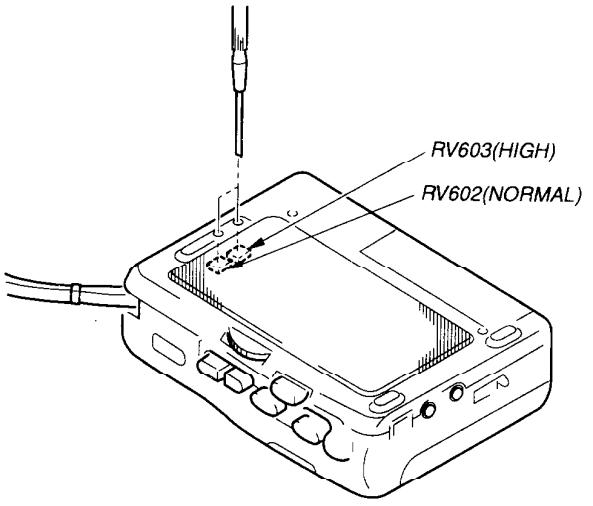
Adjust RV602 (standard)/RV603 (double speed) until the frequency counter reading
becomes 3,000 Hz at the standard mode and 1,500 Hz at the double speed mode.

Specification Value :

Tape speed	Digital frequency counter
RV602(Normal)	2,970 – 3,030Hz
RV603(High)	1,485 – 1,515Hz

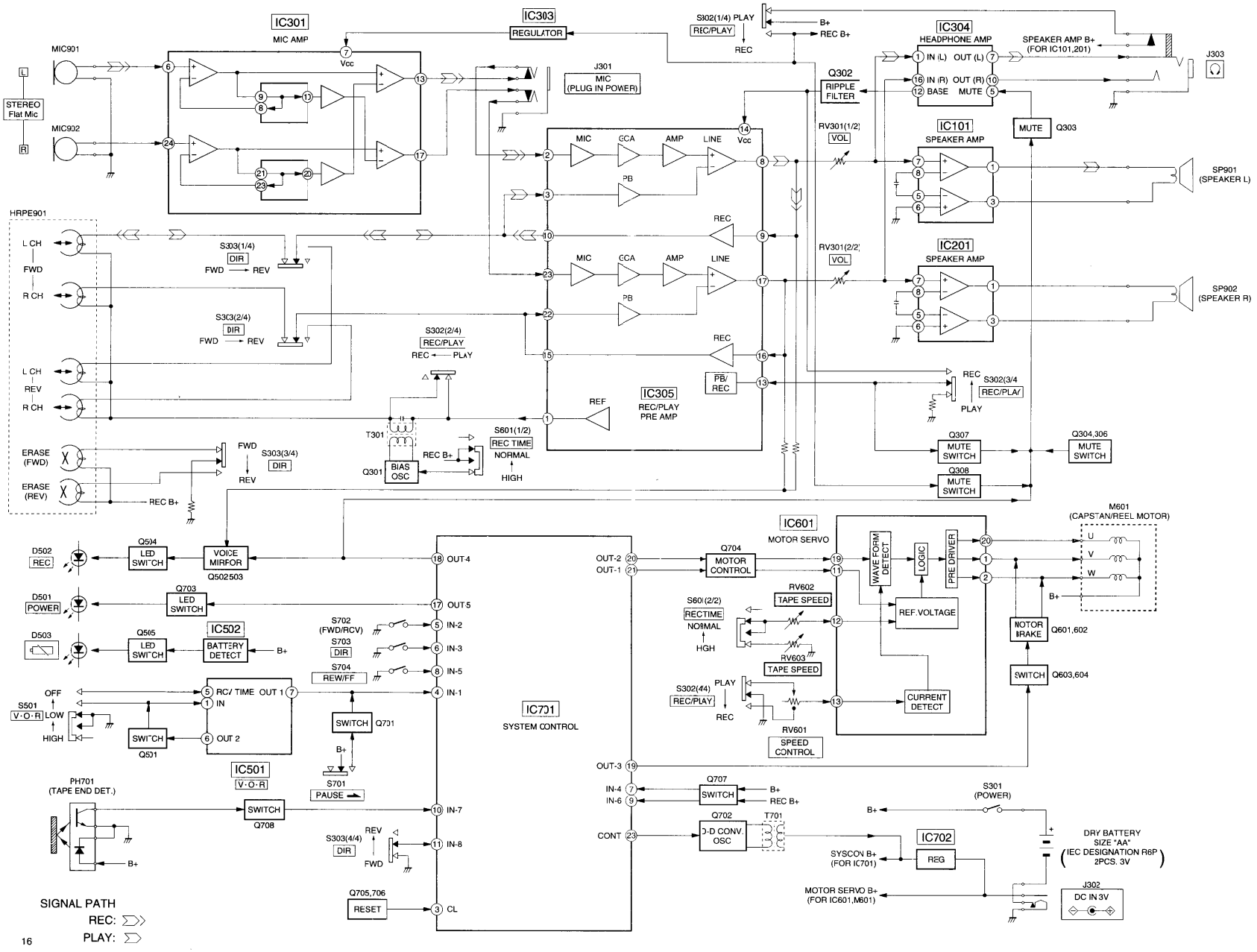
Frequency difference between the beginning and the end of the tape should be within 1% (30Hz).
Upon completion of adjustments, select the REV playback mode and check that the measurement value is within the specifications.

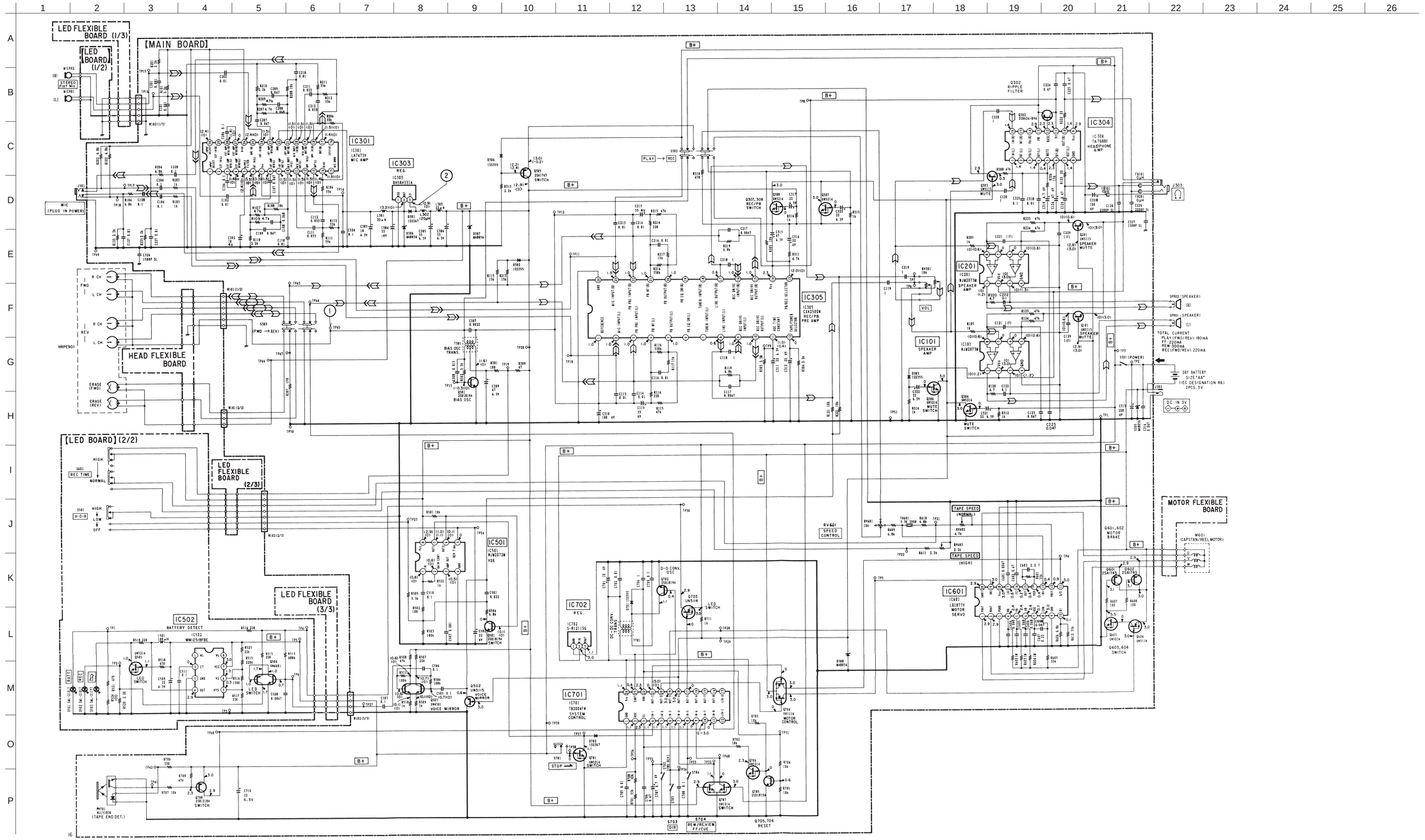
Adjustment Location :



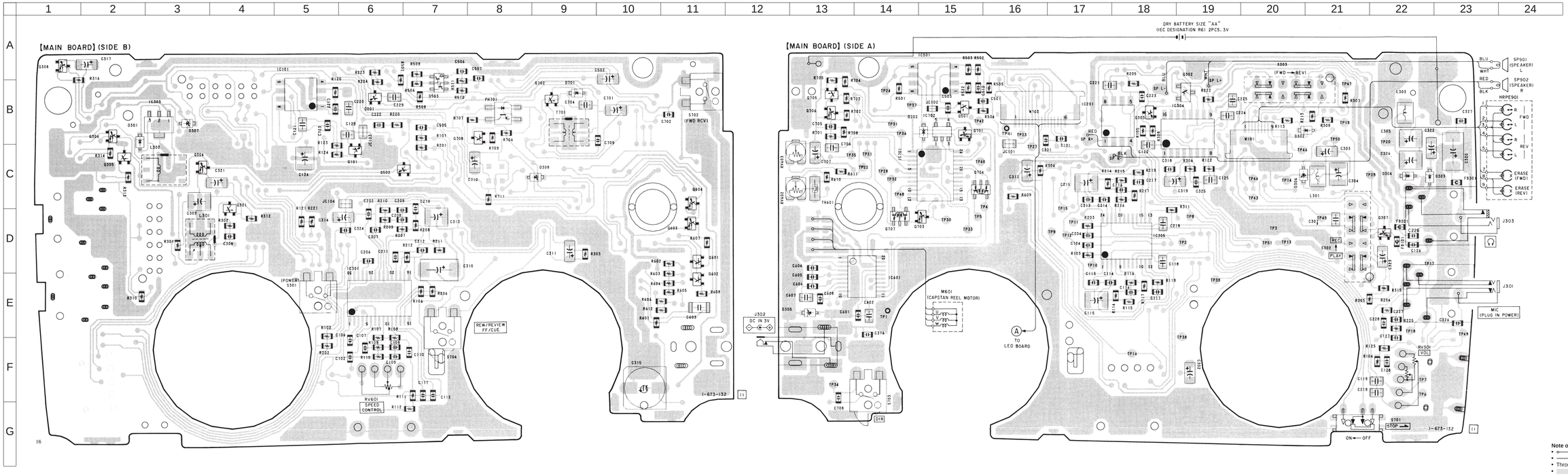
SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM




LED FLEXIBLE BOARD (1/3)
[LED BOARD] (1/2)
[MAIN BOARD]
HEAD FLEXIBLE BOARD
[LED BOARD] (2/2)
LED FLEXIBLE BOARD (2/3)
LED FLEXIBLE BOARD (3/3)
MOTOR FLEXIBLE BOARD
IC301
IC303
IC304
IC305
IC201
IC101
IC501
IC502
IC601
IC702
IC701
Q302 RIPPLE FILTER
Q303 2SA1745
Q304 2SA1745
Q501 2SA1745
Q502 UN5115
Q601, 602 MOTOR BRAKE
Q603, 604 SWITCH
Q701 2SD1816A
Q702 UN5114
Q703 UN5114
Q704 2SD1816A
Q705, 706 RESET
Q707, 708 REC/PB SWITCH
Q708 UN5214
Q709 UN5214
Q710 UN5214
Q711 UN5214
Q712 UN5214
Q713 UN5214
Q714 UN5214
Q715 UN5214
Q716 UN5214
Q717 UN5214
Q718 UN5214
Q719 UN5214
Q720 UN5214
Q721 UN5214
Q722 UN5214
Q723 UN5214
Q724 UN5214
Q725 UN5214
Q726 UN5214
Q727 UN5214

5-3. PRINTED WIRING BOARD – MAIN SECTION –



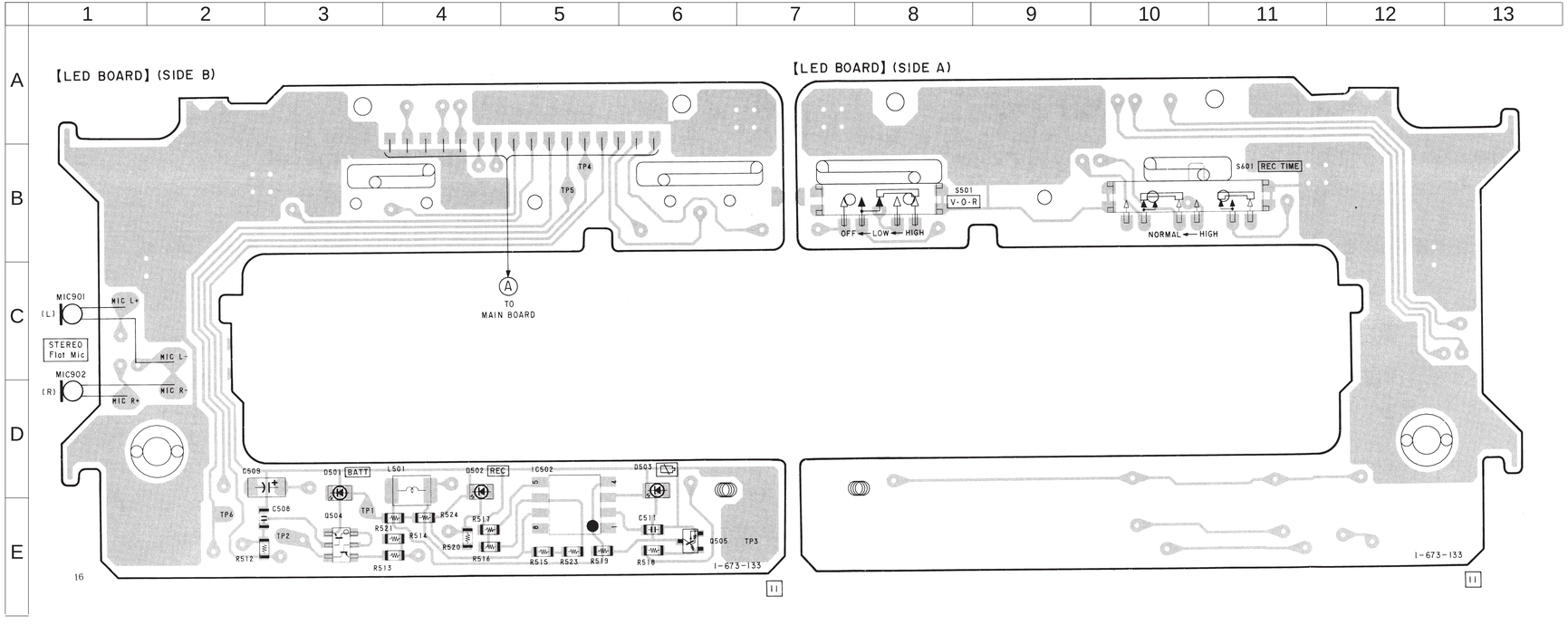
• Semiconductor Location

Ref. No.	Location
D301	B-2
D302	B-20
D303	C-23
D304	C-22
D305	E-13
D306	C-20
D307	B-3
D308	C-9
D701	B-9
D702	B-14
IC101	A-5
IC201	B-17
IC301	D-6
IC303	B-3
IC304	B-19
IC305	D-18
IC501	A-15
IC601	E-14
IC701	C-14
IC702	B-15
Q101	C-6
Q201	B-6
Q301	D-4
Q302	A-19
Q303	B-18
Q304	C-3
Q305	C-2
Q306	B-2
Q307	D-22
Q308	A-1
Q501	B-15
Q502	C-6
Q503	B-7
Q601	D-11
Q602	E-11
Q603	D-11
Q604	C-11
Q701	B-15
Q702	B-9
Q703	D-15
Q704	C-15
Q705	B-13
Q706	B-13
Q707	D-14
Q708	B-7

Note on Printed Wiring Board:
- ⟜——: parts extracted from the component side.
- ——: parts extracted from the conductor side.
- Through hole is omit.
- : Pattern from the side which enables seeing.

Caution:
Pattern face side: (SIDE A) — Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (SIDE B) — Parts on the parts face side seen from the parts face are indicated.

5-4. PRINTED WIRING BOARD – LED SECTION –



• Semiconductor Location

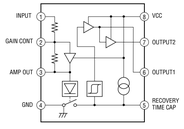
Ref. No.	Location
D501	E-3
D502	E-4
D503	E-6
IC502	E-5
Q504	E-3
Q505	E-7

Note on Printed Wiring Board:
- ⟜——: parts extracted from the component side.
- ——⟜: parts extracted from the conductor side.
- Through hole is omit.
- ▨: Pattern from the side which enables seeing.

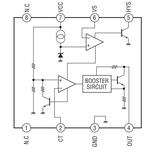
Caution:
Pattern face side: (SIDE A) — Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (SIDE B) — Parts on the parts face side seen from the parts face are indicated.

5-5. IC BLOCK DIAGRAMS

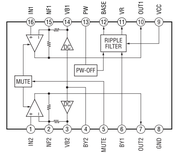
IC501 NJM2072M



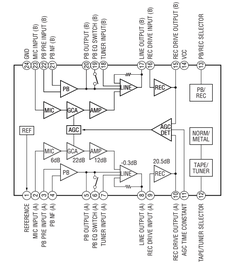
IC502 MM1251BFBE



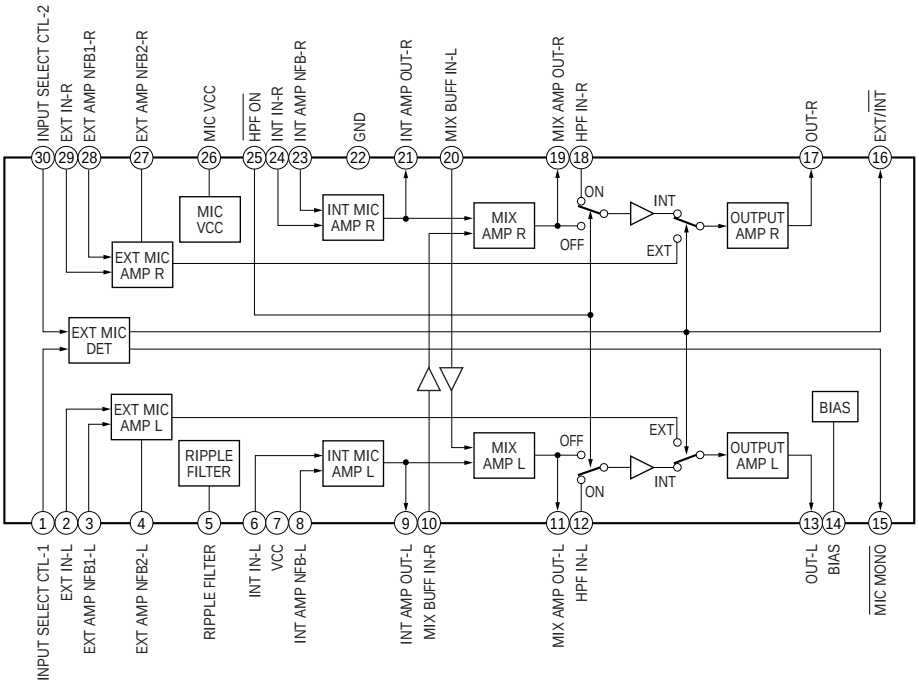
IC304 TA7688F-S0



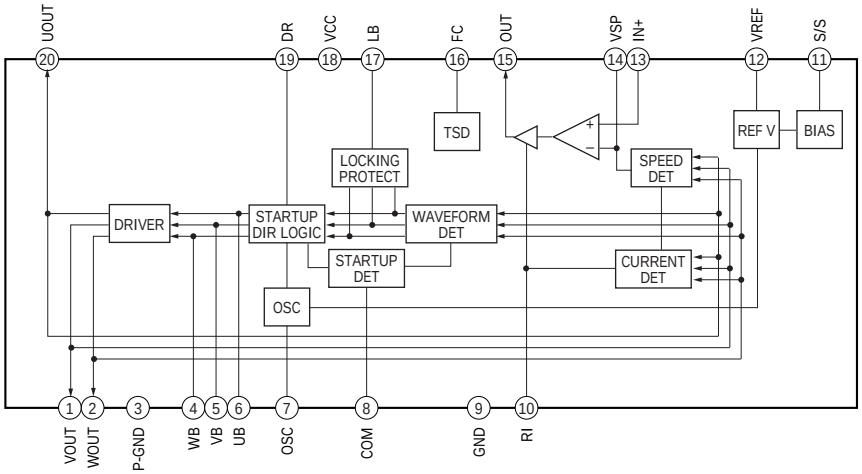
IC305 CXA2500N-T4



IC301 LA7473V-TLM



IC601 LB1877V-TLM



5-6. IC PIN FUNCTION DESCRIPTION

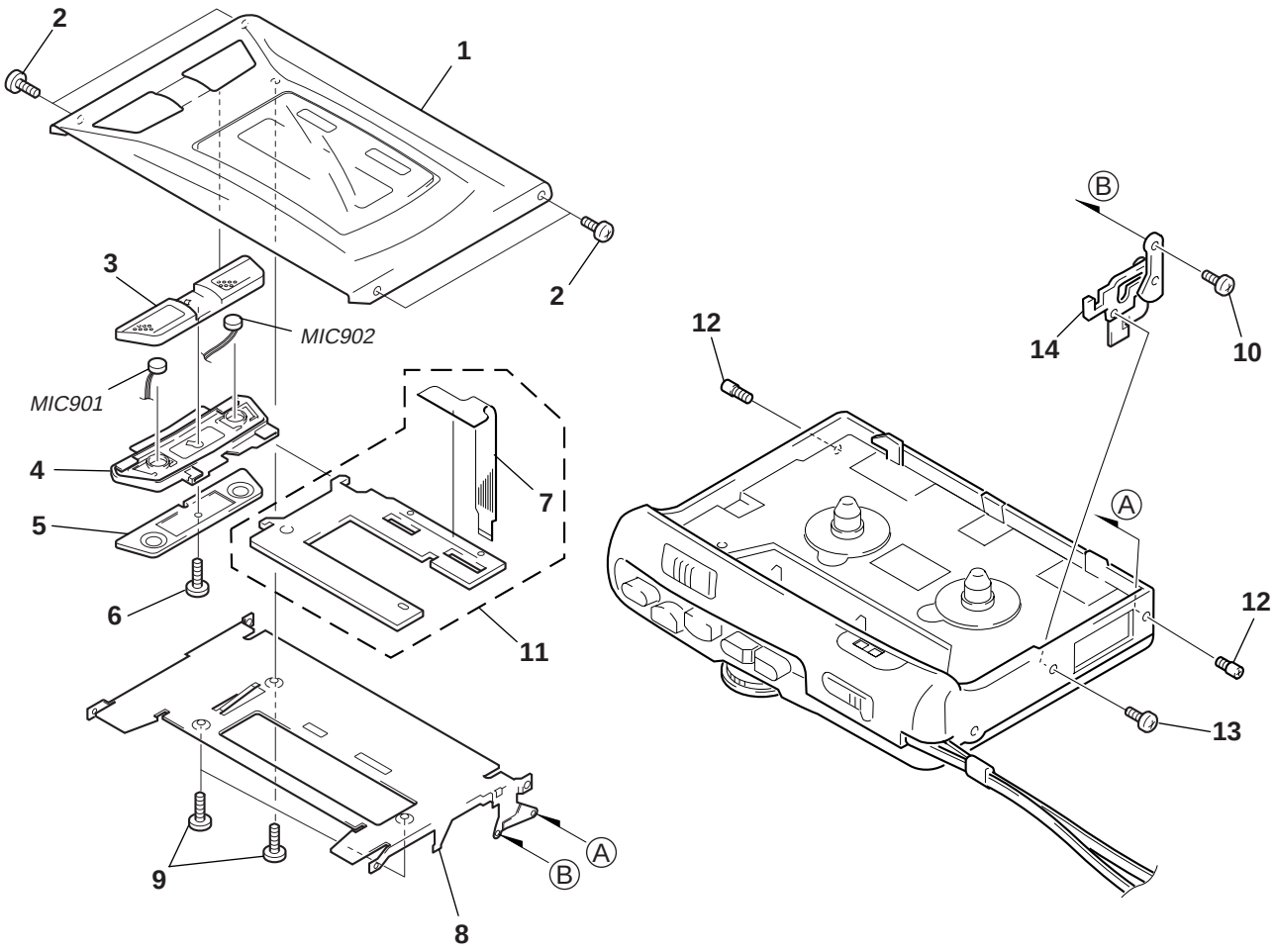
IC701 TB2004FN-020-ER(SYSTEM CONTROL)/MAIN BOARD

Pin No.	Pin Name	I/O	Description
1	GND	–	Ground
2	OSC	–	For generation of system clock (fosc = 3.2 kHz)
3	CL	I	Reset signal input
4	IN-1	I	PAUSE ON/OFF by the PAUSE switch and V•O•R switch "L": ON, "OPEN": OFF
5	IN-2	I	Recovery to FWD when opening/closing the cassette lid "L": ON, "OPEN": OFF
6	IN-3	I	Direction "L": ON, "OPEN": OFF
7	IN-4	I	REC/PB selection "L": ON, "OPEN": OFF
8	IN-5	I	FF/REW "L": ON, "OPEN": OFF
9	IN-6	I	POWER : ON/OFF "L": ON, "OPEN": OFF
10	IN-7	I	Photo reflector pulse input for tape end detection
11	IN-8	I	FWD/REV selection "L": ON, "OPEN": OFF
12	I/O-1	–	Not used
13	I/O-2	–	Not used
14 – 16	OUT-8 – 6	–	Not used
17	OUT-5	O	LED ON/OFF "L": ON, "OPEN": OFF
18	OUT-4	O	Audio mute "L": ON, "OPEN": OFF
19	OUT-3	O	Motor brake "L": ON, "OPEN": OFF
20	OUT-2	O	Motor direction "L": FWD, "OPEN": OFF
21	OUT-1	O	Motor ON/OFF "L": ON, "OPEN": OFF
22	VDD	–	Power supply for CMOS block
23	CONT	O	Voltage doubler circuit control output
24	VCC	–	Power supply for bipolar block

SECTION 6
EXPLODED VIEWS

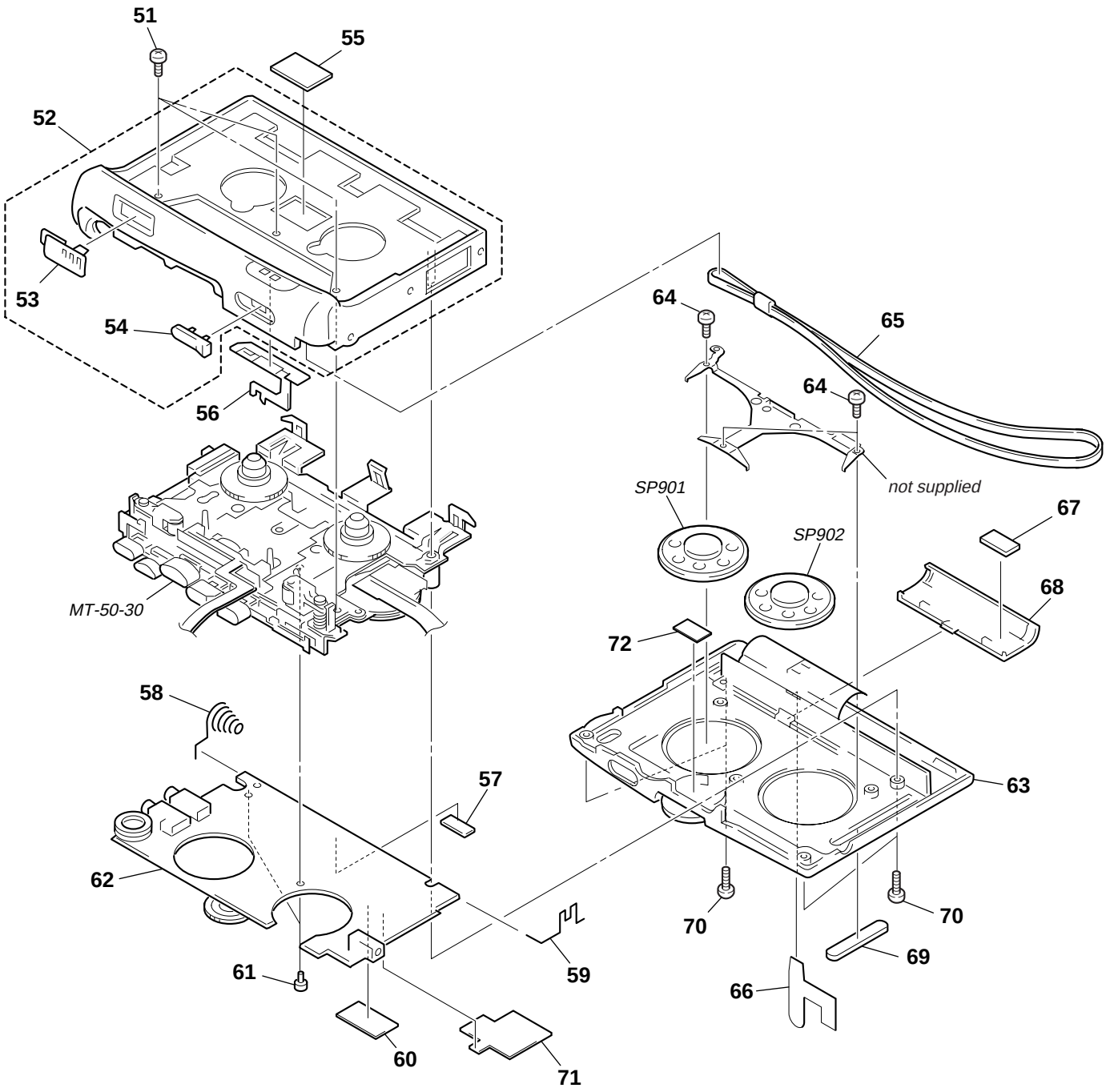
NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of this parts list.

6-1. MAIN SECTION-1



Ref. No.	Part No.	Description	Remarks
1	A-3050-908-A	LID SUB ASSY, CASSETTE	
2	3-704-197-31	SCREW(M1.4 × 3.0), LOCKING	
3	3-033-592-01	HOLDER, MICROPHONE	
4	3-033-593-01	CUSHION, MICROPHONE	
5	3-033-594-01	COVER, MICROPHONE	
6	3-318-382-31	SCREW(1.7 × 3), TAPPING	
7	1-673-130-11	PWB,LED FLEXIBLE	
* 8	3-033-584-01	HOLDER, CASSETTE	
9	3-318-382-01	SCREW(1.7 × 3), TAPPING	
10	3-311-772-11	SHAFT (A), STOPPER	
11	A-3021-186-A	LED BOARD, COMPLETE	
12	3-315-989-11	SCREW, ORNAMENTAL	
13	3-704-245-42	SCREW (1.4)	
* 14	X-3370-480-1	TOGGLE ASSY	
MIC901	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (L)	
MIC902	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (R)	

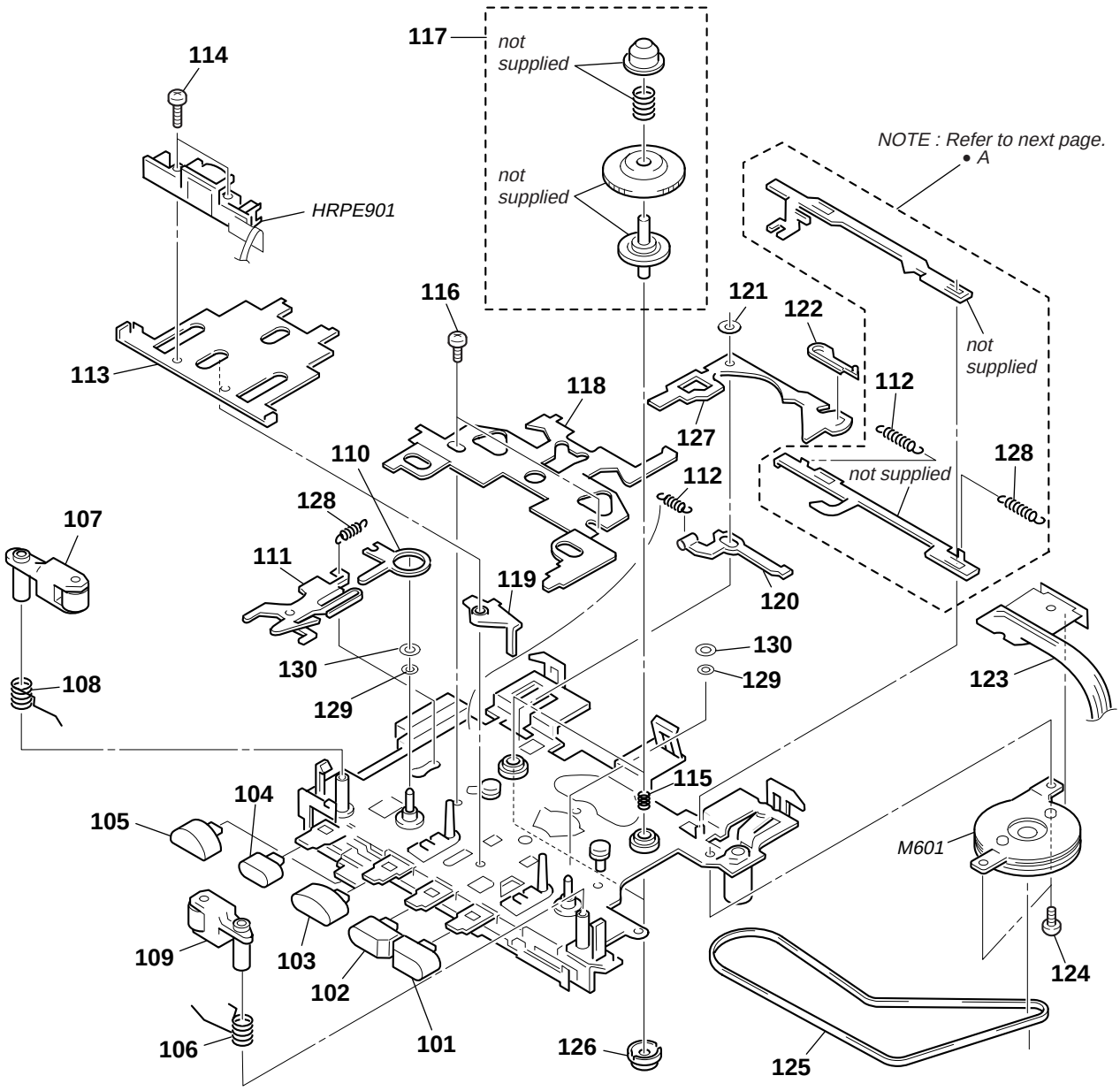
6-2. MAIN SECTION-2



Ref. No.	Part No.	Description	Remarks
51	3-704-197-33	SCREW (IB LOCK)	
52	X-3377-632-1	CABINET (FRONT) ASSY	
53	3-032-431-01	KNOB(PAUSE)	
54	3-032-432-01	KNOB(DIR)	
55	3-925-231-01	REFLECTOR	
56	X-3376-766-1	LEVER ASSY,COVERING INDICATION	
57	3-831-441-99	SPACER, KNOB	
58	3-925-230-01	SPRING, BATTERY COIL	
59	3-925-229-01	TERMINAL, PLUS	
60	4-017-441-01	CUSHION (B)	
61	3-345-648-01	SCREW (M1.4), TOOTHED LOCK	
62	A-3021-185-A	MAIN BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remarks
63	X-3377-552-1	CABINET (REAR) ASSY	
64	3-318-382-31	SCREW (1.7 × 3), TAPPING	
65	3-328-319-01	STRAP, HAND	
66	3-032-441-01	SHEET (PICK)	
67	9-911-815-01	CUSHION	
68	3-033-582-01	LID, BATTERY CASE	
69	3-032-436-01	FOOT(B), RUBBER	
70	3-318-203-92	SCREW (B1.7 × 9), TAPPING	
* 71	3-035-577-01	PAPER, SHIELD	
72	3-570-611-00	SHEET, PROTECTION, LID	
SP901	1-544-657-11	SPEAKER (3.6cm) (L)	
SP902	1-544-657-11	SPEAKER (3.6cm) (R)	

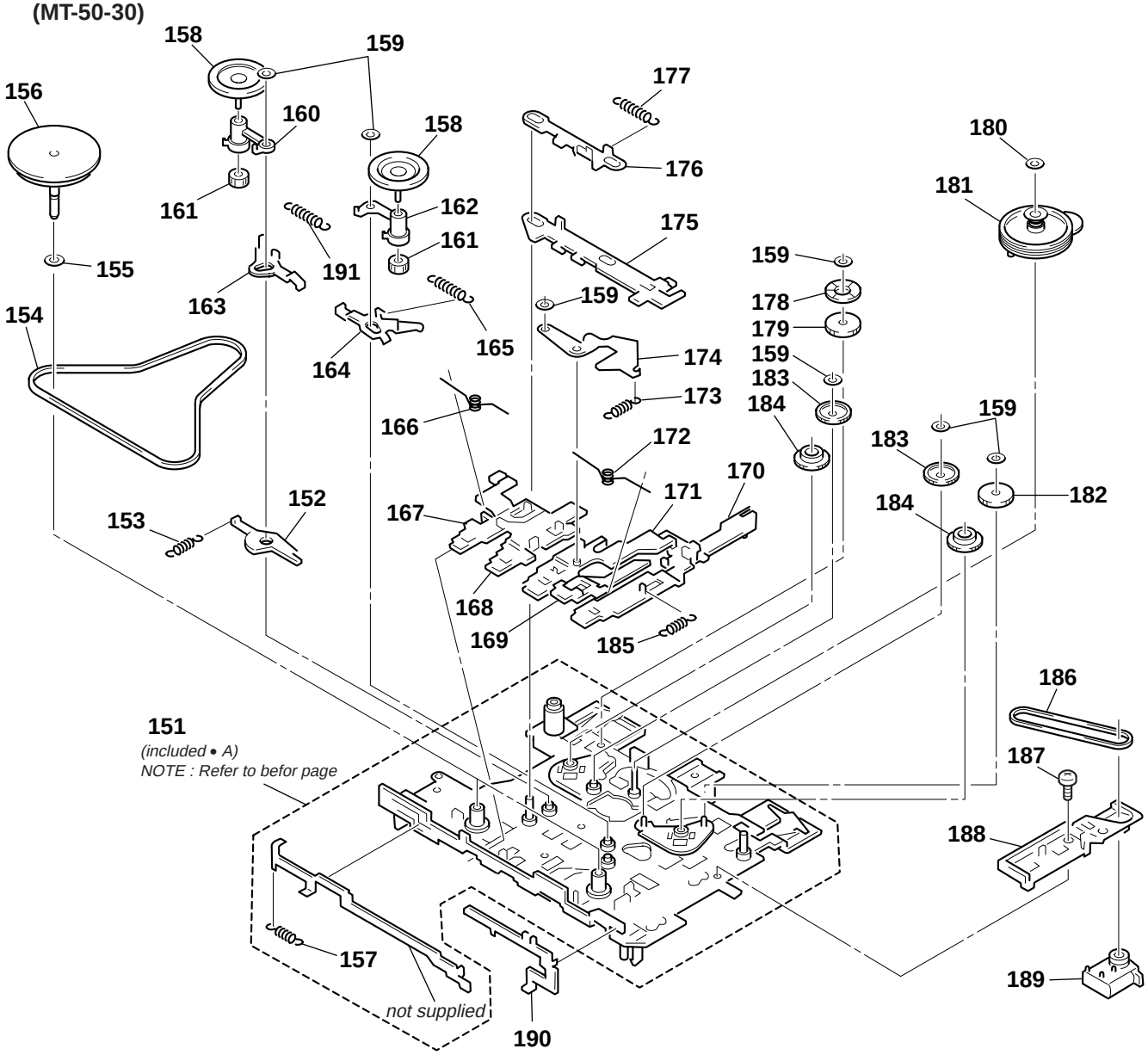
6-3. MECHANISM DECK SECTION-1
(MT-50-30)



Ref. No.	Part No.	Description	Remarks
101	3-925-247-11	BUTTON, FF	
102	3-925-246-11	BUTTON, REW	
103	3-925-245-11	BUTTON, PLAY	
104	3-032-787-01	BUTTON, REC	
105	3-925-248-11	BUTTON, STOP	
106	3-924-595-01	SPRING (PINCH-N), TORSION	
107	X-3370-380-1	ARM(PINCH-R) ASSY	
108	3-924-596-01	SPRING (PINCH-R), TORSION	
109	X-3370-379-1	ARM(PINCH-N) ASSY	
* 110	3-924-572-01	LEVER (DIR)	
* 111	3-924-575-01	LEVER (DIR-M)	
112	3-924-601-01	SPRING, TENSION	
113	X-3370-378-1	LEVER (HEAD) ASSY	
114	3-938-133-01	SCREW	
115	3-018-121-01	SPRING (B.T), COMPRESSION	
116	3-365-630-02	SCREW (M1.4)	

Ref. No.	Part No.	Description	Remarks
117	X-3370-375-1	TABLE ASSY, REEL	
* 118	3-924-535-01	LEVER (FR)	
* 119	3-924-534-01	LEVER (C/R)	
* 120	3-924-538-01	LEVER (S-OFF)	
121	3-321-483-11	RING, RETAINING	
122	3-924-569-01	PAD(S-OFF)	
123	1-657-172-11	PC BOARD, MOTOR FLEXIBLE	
124	3-704-245-42	SCREW (1.4)	
125	3-035-367-11	BELT (MOTOR)	
126	3-924-577-01	PULLEY (COUNTER)	
* 127	3-924-536-01	LEVER (OFF)	
128	3-924-602-01	SPRING, TENSION	
129	3-305-925-00	WASHER	
130	3-321-483-01	RING, RETAINING	
M601	1-698-804-21	MOTOR, DC (including PULLEY)(CAPSTAN/REEL)	
HRPE901	1-500-590-11	HEAD, MAGNETIC (REC/PB/ERAES)	

6-4. MECHANISM DECK SECTION-2
(MT-50-30)



Ref. No.	Part No.	Description	Remarks
151	X-3370-373-1	CHASSIS ASSY	
* 152	3-924-537-01	LEVER (F/R)	
153	3-924-605-01	SPRING (FF), TENSION	
154	3-924-593-01	BELT (FLYWHEEL)	
155	3-701-437-51	WASHER	
156	X-3377-138-1	FLYWHEEL ASSY	
157	3-924-602-01	SPRING, TENSION	
158	3-924-558-01	PULLEY (T)	
159	3-321-483-11	RING, RETAINING	
160	3-924-548-01	ARM(T-N)	
161	3-924-557-01	GEAR (T)	
162	3-924-549-01	ARM(T-R)	
* 163	3-924-539-01	LEVER (REW-F)	
* 164	3-924-540-01	LEVER (REW-R)	
165	3-924-603-01	SPRING (F/R), TENSION	
166	3-924-597-01	SPRING (F/R), TORSION	
* 167	3-924-568-01	LEVER (FF)	
* 168	3-924-567-01	LEVER (REW)	
* 169	3-924-566-01	LEVER (STOP)	
* 170	X-3370-377-1	LEVER (REC) ASSY	
* 171	3-924-565-01	LEVER (PLAY)	

Ref. No.	Part No.	Description	Remarks
172	3-924-598-01	SPRING (P/S), TORSION	
173	3-924-604-01	SPRING (PLAY), TENSION	
* 174	3-924-547-01	ARM (PLAY-SUB)	
* 175	3-924-545-01	LEVER (LOCK)	
* 176	3-924-546-01	LEVER (SW)	
177	3-924-606-01	SPRING (LOCK), TENSION	
178	3-924-725-01	REFLECTOR	
179	3-924-579-01	GEAR (REF)	
180	3-348-993-01	WASHER	
181	X-3370-376-1	LEVER (CENTER) ASSY	
182	3-924-556-01	GEAR (REW)	
183	3-924-562-01	GEAR (FF)	
184	3-924-560-01	GEAR (REEL)	
185	3-924-600-01	SPRING (REC), TENSION	
186	3-032-620-01	BELT (COUNTER)	
187	3-704-245-42	SCREW (1.4)	
188	3-032-438-01	BRACKET (COUNTER)	
189	1-548-582-11	COUNTER, TAPE (SMALL TYPE)	
* 190	3-924-574-01	LEVER (PAUSE)	
191	3-924-607-01	SPRING (ARM-T), TENSION	

SECTION 7
ELECTRICAL PARTS LIST

MAIN

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remarks
	A-3021-185-A	MAIN BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C104	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C106	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C107	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C108	1-164-490-11	CERAMIC CHIP	0.068uF	16V	
C109	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C110	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C111	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C112	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C113	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C114	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C115	1-135-318-11	TANTAL. CHIP	33uF	20%	4V
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C117	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C118	1-164-346-11	CERAMIC CHIP	1uF		16V
C119	1-164-346-11	CERAMIC CHIP	1uF		16V
C120	1-164-346-11	CERAMIC CHIP	1uF		16V
C121	1-164-346-11	CERAMIC CHIP	1uF		16V
C122	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C123	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C124	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C125	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C126	1-164-676-11	CERAMIC CHIP	2200PF	5%	16V
C127	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C128	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C129	1-164-346-11	CERAMIC CHIP	1uF		16V
C201	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C202	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C204	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C206	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C207	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C208	1-164-490-11	CERAMIC CHIP	0.068uF	16V	
C209	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C210	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C211	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C212	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C213	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C214	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C215	1-135-318-11	TANTAL. CHIP	33uF	20%	4V
C216	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C217	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C218	1-164-346-11	CERAMIC CHIP	1uF		16V
C219	1-164-346-11	CERAMIC CHIP	1uF		16V
C220	1-164-346-11	CERAMIC CHIP	1uF		16V
C221	1-164-346-11	CERAMIC CHIP	1uF		16V
C222	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C223	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C224	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C226	1-164-676-11	CERAMIC CHIP	2200PF	5%	16V
C227	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C228	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C229	1-164-346-11	CERAMIC CHIP	1uF		16V
C302	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C303	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C304	1-113-682-11	TANTAL. CHIP	33uF	20%	10V
C305	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C306	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C307	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C308	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
C309	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C310	1-104-848-11	TANTAL. CHIP	100uF	20%	4V
C311	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C312	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C313	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C314	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C315	1-126-246-11	ELECT CHIP	220uF	20%	4V
C316	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C317	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C318	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C319	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C320	1-104-848-11	TANTAL. CHIP	100uF	20%	4V
C321	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C322	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C323	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C324	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C325	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C326	1-164-672-11	CERAMIC CHIP	1500PF	5%	16V
C327	1-164-672-11	CERAMIC CHIP	1500PF	5%	16V
C501	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C502	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C503	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C505	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C506	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V

MAIN

Ref. No.	Part No.	Description			Remarks
C507	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C510	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C601	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C602	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C603	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C604	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C605	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C606	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C607	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V
C608	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C701	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C702	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C704	1-164-346-11	CERAMIC CHIP	1uF		16V
C705	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C706	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C707	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C708	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C709	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C710	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
		< DIODE >			
D301	8-719-049-09	DIODE	1SS367-T3SONY		
D302	8-719-988-61	DIODE	1SS355TE-17		
D303	8-719-988-61	DIODE	1SS355TE-17		
D304	8-719-988-61	DIODE	1SS355TE-17		
D305	8-719-977-03	DIODE	DTZ5.6B		
D306	8-719-977-03	DIODE	DTZ5.6B		
D307	8-719-977-03	DIODE	DTZ5.6B		
D308	8-719-977-03	DIODE	DTZ5.6B		
D701	8-719-988-61	DIODE	1SS355TE-17		
D702	8-719-049-09	DIODE	1SS367-T3SONY		
		< FERRITE BEAD >			
FB101	1-500-444-11	FERRITE	0uH		
FB201	1-500-444-11	FERRITE	0uH		
FB301	1-500-444-11	FERRITE	0uH		
		< IC >			
IC101	8-759-701-02	IC	NJM2073M		
IC201	8-759-701-02	IC	NJM2073M		
IC301	8-759-380-80	IC	LA7473V-TLM		
IC303	8-759-434-03	IC	RH5RH331A-T1		
IC304	8-759-205-43	IC	TA7688F-SO		
IC305	8-752-089-40	IC	CXA2500N-T4		
IC501	8-759-701-51	IC	NJM2072M		
IC601	8-759-566-10	IC	LB1877V-TLM		
IC701	8-759-494-76	IC	TB2004FN-020-ER		
IC702	8-759-280-84	IC	S-81211SG-QA-T1		
		< JACK >			
J301	1-774-321-31	JACK (SMALL TYPE)(MIC)			
J302	1-750-061-11	JACK,DC(POLARITY UNIFIED TYPE)(DC IN 3V)			
J303	1-695-514-21	JACK (SMALL TYPE) 1P(HEAD PHONE)			
		< JUMPER CHIP >			
JC101	1-216-295-91	SHORT	0		
JC102	1-216-864-11	METAL CHIP	0	5%	1/16W
JC103	1-216-295-91	SHORT	0		
JC104	1-216-295-91	SHORT	0		

Ref. No.	Part No.	Description			Remarks
		< COIL >			
L301	1-412-030-11	INDUCTOR CHIP	22uH		
L302	1-414-222-11	INDUCTOR	120uH		
L303	1-412-030-11	INDUCTOR CHIP	22uH		
		< PHOTO INTERRUPTER >			
PH701	8-749-925-05	REFLECTOR NJL5183KA-F20-TE1			
		< TRANSISTOR >			
Q101	8-729-420-53	TRANSISTOR	UN5115		
Q201	8-729-420-53	TRANSISTOR	UN5115		
Q301	8-729-230-63	TRANSISTOR	2SC4116-YG		
Q302	8-729-141-48	TRANSISTOR	2SB624-BV345		
Q303	8-729-420-53	TRANSISTOR	UN5115		
Q304	8-729-402-93	TRANSISTOR	UN5214-TX		
Q305	8-729-823-86	TRANSISTOR	2SA1745		
Q306	8-729-402-93	TRANSISTOR	UN5214-TX		
Q307	8-729-402-93	TRANSISTOR	UN5214-TX		
Q308	8-729-402-93	TRANSISTOR	UN5214-TX		
Q501	8-729-230-63	TRANSISTOR	2SC4116-YG		
Q502	8-729-420-53	TRANSISTOR	UN5115		
Q503	8-729-402-81	TRANSISTOR	XN4501		
Q601	8-729-823-86	TRANSISTOR	2SA1745		
Q602	8-729-823-86	TRANSISTOR	2SA1745		
Q603	8-729-402-93	TRANSISTOR	UN5214-TX		
Q604	8-729-402-96	TRANSISTOR	UN5114		
Q701	8-729-402-93	TRANSISTOR	UN5214-TX		
Q702	8-729-230-63	TRANSISTOR	2SC4116-YG		
Q703	8-729-402-96	TRANSISTOR	UN5114		
Q704	8-729-422-41	TRANSISTOR	XN1114		
Q705	8-729-230-63	TRANSISTOR	2SC4116-YG		
Q706	8-729-402-93	TRANSISTOR	UN5214-TX		
Q707	8-729-420-16	TRANSISTOR	XN1214		
Q708	8-729-420-24	TRANSISTOR	2SB1218A-QRS		
		< RESISTOR >			
R101	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R102	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R103	1-216-821-11	METAL CHIP	1K	5%	1/16W
R104	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W
R106	1-216-839-11	METAL CHIP	33K	5%	1/16W
R107	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R108	1-216-833-91	RES,CHIP	10K	5%	1/16W
R109	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R110	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R111	1-216-839-11	METAL CHIP	33K	5%	1/16W
R112	1-216-839-11	METAL CHIP	33K	5%	1/16W
R113	1-216-835-11	METAL CHIP	15K	5%	1/16W
R114	1-216-813-11	METAL CHIP	220	5%	1/16W
R115	1-216-841-11	METAL CHIP	47K	5%	1/16W
R116	1-216-851-11	METAL CHIP	330K	5%	1/16W
R117	1-216-835-11	METAL CHIP	15K	5%	1/16W
R119	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R120	1-216-793-11	RES,CHIP	4.7	5%	1/16W
R121	1-216-833-91	RES,CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R122	1-216-801-11	METAL CHIP	22	5%	1/16W
R123	1-216-841-11	METAL CHIP	47K	5%	1/16W
R124	1-216-841-11	METAL CHIP	47K	5%	1/16W
R125	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R201	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R202	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R203	1-216-821-11	METAL CHIP	1K	5%	1/16W
R204	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R205	1-216-821-11	METAL CHIP	1K	5%	1/16W
R206	1-216-839-11	METAL CHIP	33K	5%	1/16W
R207	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R208	1-216-833-91	RES,CHIP	10K	5%	1/16W
R209	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R210	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R211	1-216-839-11	METAL CHIP	33K	5%	1/16W
R212	1-216-839-11	METAL CHIP	33K	5%	1/16W
R213	1-216-835-11	METAL CHIP	15K	5%	1/16W
R214	1-216-813-11	METAL CHIP	220	5%	1/16W
R215	1-216-841-11	METAL CHIP	47K	5%	1/16W
R216	1-216-851-11	METAL CHIP	330K	5%	1/16W
R217	1-216-835-11	METAL CHIP	15K	5%	1/16W
R219	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R220	1-216-793-11	RES,CHIP	4.7	5%	1/16W
R221	1-216-833-91	RES,CHIP	10K	5%	1/16W
R222	1-216-801-11	METAL CHIP	22	5%	1/16W
R223	1-216-841-11	METAL CHIP	47K	5%	1/16W
R224	1-216-841-11	METAL CHIP	47K	5%	1/16W
R225	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R301	1-216-809-11	METAL CHIP	100	5%	1/16W
R302	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R303	1-216-863-11	RES,CHIP	3.3M	5%	1/16W
R304	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R305	1-216-833-91	RES,CHIP	10K	5%	1/16W
R306	1-216-835-11	METAL CHIP	15K	5%	1/16W
R307	1-216-811-11	METAL CHIP	150	5%	1/16W
R308	1-216-841-11	METAL CHIP	47K	5%	1/16W
R309	1-216-805-11	METAL CHIP	47	5%	1/16W
R310	1-216-817-11	METAL CHIP	470	5%	1/16W
R311	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R312	1-216-821-11	METAL CHIP	1K	5%	1/16W
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R314	1-216-821-11	METAL CHIP	1K	5%	1/16W
R315	1-216-821-11	METAL CHIP	1K	5%	1/16W
R316	1-216-821-11	METAL CHIP	1K	5%	1/16W
R501	1-216-833-91	RES,CHIP	10K	5%	1/16W
R502	1-216-809-11	METAL CHIP	100	5%	1/16W
R503	1-216-845-11	METAL CHIP	100K	5%	1/16W
R504	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R505	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R506	1-216-845-11	METAL CHIP	100K	5%	1/16W
R507	1-216-837-11	METAL CHIP	22K	5%	1/16W
R508	1-216-841-11	METAL CHIP	47K	5%	1/16W
R509	1-216-821-11	METAL CHIP	1K	5%	1/16W
R510	1-216-821-11	METAL CHIP	1K	5%	1/16W
R511	1-216-845-11	METAL CHIP	100K	5%	1/16W
R522	1-216-821-11	METAL CHIP	1K	5%	1/16W
R601	1-216-839-11	METAL CHIP	33K	5%	1/16W
R602	1-216-857-11	METAL CHIP	1M	5%	1/16W
R603	1-216-857-11	METAL CHIP	1M	5%	1/16W
R604	1-216-857-11	METAL CHIP	1M	5%	1/16W
R605	1-216-839-11	METAL CHIP	33K	5%	1/16W
R606	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R607	1-216-809-11	METAL CHIP	100	5%	1/16W
R608	1-216-809-11	METAL CHIP	100	5%	1/16W
R609	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R610	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R611	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R612	1-216-839-11	METAL CHIP	33K	5%	1/16W
R701	1-216-839-11	METAL CHIP	33K	5%	1/16W
R702	1-216-833-91	RES,CHIP	10K	5%	1/16W
R703	1-216-833-91	RES,CHIP	10K	5%	1/16W
R704	1-216-833-91	RES,CHIP	10K	5%	1/16W
R705	1-216-833-91	RES,CHIP	10K	5%	1/16W
R706	1-216-815-11	METAL CHIP	330	5%	1/16W
R707	1-216-833-91	RES,CHIP	10K	5%	1/16W
R708	1-216-833-91	RES,CHIP	10K	5%	1/16W
R709	1-216-841-11	METAL CHIP	47K	5%	1/16W
R711	1-216-821-11	METAL CHIP	1K	5%	1/16W
		< VARIABLE RESISTOR >			
RV601	1-225-293-11	RES, VAR, CARBON 10K(SPEED CONTROL)			
RV602	1-238-663-11	RES, ADJ, CARBON 4.7K			
RV603	1-223-584-11	RES, ADJ, CARBON 2.2K			
		< SWITCH >			
S301	1-762-594-41	SWITCH, PUSH (1 KEY)(POWER)			
S302	1-692-896-11	SWITCH, SLIDE(PLAY/REC)			
S303	1-692-896-11	SWITCH, SLIDE(FWD/REV)			
S701	1-572-922-11	SWITCH, SLIDE(STOP)			
S702	1-572-688-11	SWITCH, PUSH (1 KEY)(FWD RCV)			
S703	1-572-288-21	SWITCH, PUSH(DIR)			
S704	1-762-594-41	SWITCH, PUSH (1 KEY)(REW/FF)			
		< TRANSFORMER >			
T301	1-433-286-11	TRANSFORMER, BIAS OSCILLATION			
T701	1-450-667-11	TRANSFORMER, DC-DC CONVERTER			
		< THERMISTOR >			
TH601	1-810-794-11	THERMISTOR, POSITIVE			
		< FLAT CABLE >			
W101	1-750-336-21	CONNECTOR, FFC/FPC (ZIF) 9P			
W102	1-573-925-11	CONNECTOR, FFC/FPC (ZIF) 16P			
**********					
	A-3021-186-A	LED BOARD, COMPLETE			
		**********			
	1-673-130-11	PWB,LED FLEXIBLE			
		< CAPACITOR >			
C508	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C509	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C511	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V

LED

Ref. No.	Part No.	Description			Remarks
		< DIODE >			
D501	8-719-059-96	DIODE SML-210LT-T86(POWER)			
D502	8-719-059-96	DIODE SML-210LT-T86(REC)			
D503	8-719-057-99	DIODE SML-211YT-T86 (BATT CHECK)			
		< IC >			
IC502	8-759-399-49	IC MM1251BFBE			
		< COIL >			
L501	1-412-032-11	INDUCTOR CHIP	100uH		
		< TRANSISTOR >			
Q504	8-729-402-84	TRANSISTOR	XN4601		
Q505	8-729-402-93	TRANSISTOR	UN5214-TX		
		< RESISTOR >			
R512	1-216-855-11	METAL CHIP	680K	5%	1/16W
R513	1-216-813-11	METAL CHIP	220	5%	1/16W
R514	1-216-813-11	METAL CHIP	220	5%	1/16W
R515	1-216-849-11	METAL CHIP	220K	5%	1/16W
R516	1-216-847-11	METAL CHIP	150K	5%	1/16W
R517	1-216-839-11	METAL CHIP	33K	5%	1/16W
R518	1-216-841-11	METAL CHIP	47K	5%	1/16W
R519	1-216-813-11	METAL CHIP	220	5%	1/16W
R520	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R521	1-216-817-11	METAL CHIP	470	5%	1/16W
R523	1-216-837-11	METAL CHIP	22K	5%	1/16W
R524	1-216-809-11	METAL CHIP	100	5%	1/16W
		< SWITCH >			
S501	1-692-605-31	SWITCH, SLIDE(VOR)			
S601	1-571-277-51	SWITCH, SLIDE(REC TIME)			

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		**********	
123	1-657-172-11	PC BOARD, MOTOR FLEXIBLE	
189	1-548-582-11	COUNTER, TAPE (SMALL TYPE)	
M601	1-698-804-21	MOTOR, DC (including PULLEY)(CAPSTAN/REEL)	
SP901	1-504-314-12	SPEAKER (3.6CM) (L)	
SP902	1-504-314-12	SPEAKER (3.6CM) (R)	
MIC901	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (L)	
MIC902	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (R)	
HRPE901	1-500-590-11	HEAD, MAGNETIC (REC/PB/ERAES)	
**********			
		ACCESSORIES & PACKING MATERIALS	
		**********	
	X-2542-167-1	STAND ASSY	
	3-032-436-01	FOOT(B), RUBBER	
	3-865-283-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH)(US/Canadian)	
	3-865-283-21	MANUAL, INSTRUCTION (ENGLISH/SPANISH/PORTUGUESE)(AEP/E)	
	3-865-283-31	MANUAL, INSTRUCTION (FRENCH/GERMAN/DUTCH)(AEP)	
	3-865-283-41	MANUAL, INSTRUCTION (SWEDISH/ITALIAN/FINNISH)(AEP)	
	8-814-296-90	MICROPHONE, CONDENSER ECM-TC60	
	8-953-130-90	HEADPHONE MDR-E801/K SET(AEP)	

Sony Corporation
Personal A&V Products Company

99C1684-1
Printed in Japan © 1999.3
Published by Quality Engineering Dept. (Shinagawa)